Kontron Linux BSP for KT690/mITX R01.00

1. Revision history

Revision	Date	Author	Description
1.0	10.03.2011	Viktor Krasnov	Initial revision
1.01	11.03.2011	Vitaly Bordyug	Minor changes

2. Table of contents

3. Introduction

This document describes Linux Board Support Package (BSP) for Kontron KT690/mITX board. It provides:

- a summary of BSP features;
- build and installation notes;
- listing of the release package contents.

4. Supported features/drivers

- AMD Athlon Neo X2 BGA Dual Core processor
- Integrated ATI RadeonTM X1200 graphics core
- Realtek ALC888 High Definition Audio
- Intel® Gigabit Ethernet
- AMD M690T + SB600
- SATA, PATA, Compact Flash
- RAID
- PCI, PCI-Express
- USB 1.1/2.0
- RTC, ACPI SMBIOS, TPM, Watchdog
- Kontron KTAPI

5. Unsupported features/drivers

- GPIO
- Kontron K-Station;
- Kontron KEAPI support

6. BSP Components

File name in delivery	**Description**
Kontron_Linux_KT690_mITX_LiveCD_R01.00.iso	LiveCD image for Kontron Linux BSP
installation_tools.zip	Utilities to make a bootable USB flash from ISO image on Linux and Windows hosts
qa_delivery_R01.00_090311.zip	Testcases, QA logs, and related documents
RPMS/kernel-*	Linux Kernel and headers RPM
RPMS/kontron-logos-12.2-2.fc13.noarch.rpm	Logos, graphics and themes for Kontron Linux
RPMS/ktapi-1.0-0.x86_64.rpm	KT API utility library RPM
RPMS/generic*	Xorg configuration to work around video port initialization issue
SRPMS/kernel-2.6.34.7-61.KT690.fc13.src.rpm	Linux Kernel source RPM package
SRPMS/kontron-logos-12.2-2.fc13.src.rpm	Sources of Logos and themes for Kontron Linux
SRPMS/ktapi-1.0-0.src.rpm	KT API utility library source package
SRPMS/generic-release-12-2.src.rpm	Xorg configuration to work around video port initialization issue

7. Installation and BSP set up procedures

The Kontron Linux distribution is a LiveCD image, which can be burned to the bootable media. It is then possible to evaluate functionality, and to install it into Hard Drive/CompactFlash/other persistent storage. There are two ways to deploy the BSP image:

- Write CDROM with appropriate OS software (Windows or Linux host OS)
- Create bootable USB stick with supplied utility (Windows or Linux host OS)

7.1 Writing BSP ISO image to CD

In Windows OS, it is recommended to use the appropriate software that is able to write ISO9660 imate to CD.

In Linux host operating system, issue «cdrecord» command to burn BSP image to CD or DVD media. Example of the execution and respective output are below.

```
# cdrecord Kontron_Linux_KT690_mITX_LiveCD_R01.00.iso
wodim: No write mode specified.
wodim: Asuming -tao mode.
wodim: Future versions of wodim may have different drive dependent
defaults.
Device was not specified. Trying to find an appropriate drive...
Looking for a CD-R drive to store 672.00 MiB...
Detected CD-R drive: /dev/cdrw
Using /dev/cdrom of unknown capabilities
Device type    : Removable CD-ROM
Version        : 5
Response Format: 2
Capabilities   :
Vendor_info    : 'HL-DT-ST'
Identification : 'DVDRAM GSA-U10N '
Revision       : '1.05'
Device seems to be: Generic mmc2 DVD-R/DVD-RW.
Using generic SCSI-3/mmc   CD-R/CD-RW driver (mmc_cdr).
Driver flags   : MMC-3 SWABAUDIO BURNFREE
Supported modes: TAO PACKET SAO SAO/R96P SAO/R96R RAW/R16 RAW/R96P
RAW/R96R
Speed set to 4234 KB/s
Starting to write CD/DVD at speed  24.0 in real TAO mode for
single session.
Last chance to quit, starting real write in    0 seconds.
Operation starts.
Track 01: Total bytes read/written: 704643072/704643072 (344064
sectors).
```

Then attach CDROM to KTQ690, set up BIOS to boot from CD, make sure the CDROM is IDE Master, insert prepared CD media into KTQ690 CDROM, and exit saving BIOS settings.

7.2 Writing BSP ISO image to USB flash/disk

7.2.1 On Linux host:

1. install USB disk of capacity more then 1G into host USB slot
2. write ISO onto disk with the command:

```
#  ./livecd-iso-to-disk --noverify --format --reset-mbr
Kontron_Linux_KT690_mITX_LiveCD_R01.00.iso /dev/[your device]
```

Output will appear, similar to the below:

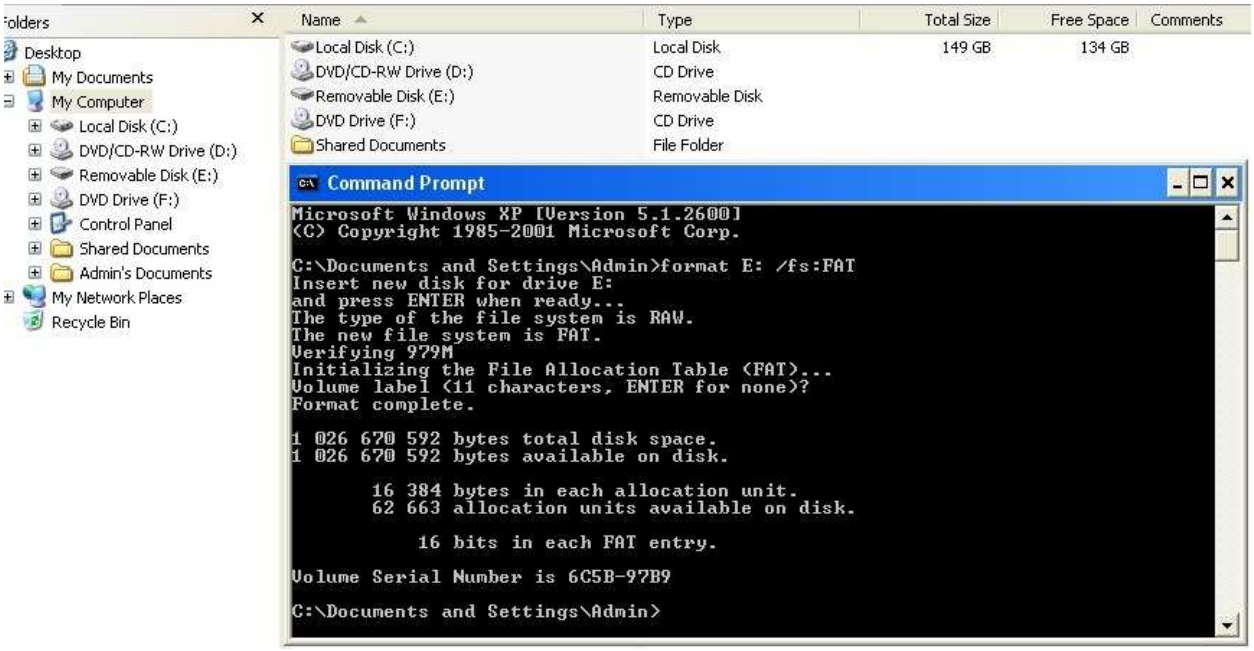
```
WARNING: THIS WILL DESTROY ANY DATA ON /dev/sdb!!!
Press Enter to continue or ctrl-c to abort
```

```
Waiting for devices to settle...
mkdosfs 3.0.1 (23 Nov 2008)
Copying live image to USB stick
Updating boot config file
Installing boot loader
USB stick set up as live image!
```

To boot the Kontron Linux distribution, insert it into KT690 USB slot, enable booting from USB in BIOS, save settings and reset the board.

7.2.2 On Windows host:

1. install LiveUSB Creator on the host by running liveusb-creator-3.9.1-setup.exe
2. install USB disk of capacity more then 1G into host USB slot, run command shell as Administrator and format the USB disk:



> format <disk> /fs:FAT

3. run LiveUSB Creator: in the field “Use existing Live CD” specify `Kontron_Linux_KT690_mITX_LiveCD_R01.00.iso` ; in the field “Target Device” specify previously formatted USB disk; click on the button “Create LiveUSB”:

To boot the Kontron Linux distribution, insert it into KT690 USB slot, enable booting from USB in BIOS, save settings and reset the board

7.3 Installation of the Kontron Linux BSP to persistent storage

It is possible to install the live image to persistent storage. The HDD or CompactFlash should have at least 2 Gb of free space for the installation to succeed. In order to install Kontron Linux, proceed with the following steps:

1. Boot the BSP image either from LiveCD or bootable USB stick
2. Authorize as "Live System User"
3. Configure display by executing: System->Preferences->Monitors (by default clone mode with 640x480 resolution is used).
4. Run "Install to Hard Drive" by clicking on its icon.
5. Install BSP following on-screen instructions [1]

Note: during first startup (after installing BSP to persistent storage) the configuration menu appears, but some submenus and buttons may be not visible due to limitations of video mode. So, these configuration steps can be skipped by pressing Enter on keyboard.

[1] Make sure that the checkbox "Review and modify partitioning layout" is set to review it and avoid USB disk overwrite. Before re-installing BSP, remove previous installation manually.

8. Known issues

- DVI doesn't work with radeon driver (it can be worked around by using vesa);
- Radeon driver ignores BIOS settings and initializes all video outputs. So the clone mode with 640x480 resolution is used to prevent GUI malfunction (it's activated by /etc/X11/xorg.conf.d/99-KT690-clone-mode.conf);
- CPU speed stepping doesn't work due to BIOS issue (no compatible ACPI _PSS objects found). This is similar to http://en.gentoo-wiki.com/wiki/Lenovo_Thinkpad_Edge_13_AMD#DSDT);
- miniPCI-Express, 7.1 sound, SPDIF and RAID-10 were not tested because corresponding equipment is absent;
- KTAPI beta version is used;
- TPM issues:
    - tests for PKCS11 are failed;
    - public TPM's Endorsement Key is limited to be used only by owner.